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ABSTRACT

Library automation in Canada is complicated by the large size, dispersed population, and cultural diversity of the country. The National Library of Canada is actively planning a Canadian library network based on national bibliographic services for which the library is now developing automated systems. Canadian libraries are involved in the planning through cooperative projects, consultation, pilot projects, and training seminars. The National Library develops the standards necessary for successful cooperative use of bibliographic machine-readable records. The Canadian National Science Library concentrates on information retrieval services utilizing available data bases. At the regional or provincial level, a number of other automation projects are taking place or being planned. The central provinces of Ontario and Quebec are most advanced in planning bibliographic systems for various types of libraries. These could become part of a total provincial system that forms a node of the national system. (Author/PF)

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The State of Planning of Automation Projects in the Libraries of Canada

by Hope E.A. Clement

Paper presented to the Session of the
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THE STATE OF PLANNING OF AUTOMATION PROJECTS IN THE LIBRARIES OF CANADA

by

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Factors affecting the automation of Canadian libraries

There are a number of geographical, political and cultural factors which are not, when considered individually, unique to Canada, but which when combined in a single country do present an unparalleled situation. These factors affect many aspects of Canadian life, among them the development of libraries and their automation projects, especially from the point of view of cooperative projects, networks and planning on a national scale.

Canada is a huge country, with vast uninhabited territories to the north and a small population concentrated in a thin line stretching for 4,000 miles from St. John's, Newfoundland, to Victoria, British Columbia. This presents a communications problem. Telecommunications costs to link the main centres of population into a library network are high and the four time zones into which the country is divided further complicates the situation. Document delivery by conventional methods is slow but by the newer technology, such as telefacsimile it is still cost-prohibitive. Canada's capital, Ottawa, is not located in the geographic centre of the country, and even if it were, the coastal provinces of the Atlantic and the Pacific would still have

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to pay higher communication costs to communicate with the National Library in Ottawa, than do neighbouring provinces. The recent establishment of data communication lines linking major centres is improving the situation by lowering communication costs, but one cannot expect equalization of line charges for all libraries regardless of location until the availability of satellite transmission at a cost which libraries can support.

On the political level, Canada is divided into ten provinces and two territories all of which vary greatly in area and population. Some provinces are too small to support a bibliographic centre or large data base. To promote nationwide library cooperation and to develop a Canadian library network, the federal government has to deal with the governments of the ten provinces; public libraries depend on a third level of government, the municipal. The division of powers between the federal and provincial governments under the British North America Act gives responsibility for education to the provinces. There is no federal department of education and federal involvement in areas of education such as libraries can be a politically sensitive issue. Thus the development of library cooperative projects involves multi-level governmental negotiations.

Culturally also, Canada is diverse. A bilingual country having both English and French as official languages, Canadians have close ties with the mother countries of the two founding nations, England and France, but there are also strong continental North American ties with the United States. Canadian libraries rely heavily on Library of Congress cataloguing data and thus on American cataloguing standards. The output of the Canadian publishing industry represents only a very small part of the acquisitions of Canadian libraries. English language material may be acquired in either the British or American edition; French language libraries buy heavily in France. Thus Canadian libraries have a great need for cataloguing data from other countries. The requirement for bilingual access to data, and consequently the production of bilingual

national bibliographic tools complicates the development of machine formats for bibliographic data and the writing of library and information retrieval programs. Many libraries must serve clientele in both English and French.

These geographical, political and cultural factors must be taken into account in planning at the national level for library automation standards and systems.

Planning at the national level

National Library of Canada

The National Library of Canada is a relatively young institution; it began in 1953. It provides major national bibliographic services, such as the national bibliography, Canadiana, and the Canadian Union Catalogue. It sees its role in planning for automation in Canadian libraries as one of providing leadership and expertise in the development of standards, in the promotion of compatible and cooperative systems, in the provision of bibliographic data received from many sources in machine-readable form to Canadian libraries and in the planning for, promotion and development of a Canadian library network based on a national bibliographic data base.

Automation began at the National Library in 1967, when as an emergency measure because the manual system was breaking down, a system for producing the index to the national bibliography by computer was designed and implemented. Following this successful first experience with the use of EDP, rather than proceed with the automation of National Library operations chosen on a most critical area basis, with the possible danger of incompatibilities being created in operations which should interface with one another, the National Librarian decided that a total feasibility study of all National Library procedures should be done to determine those areas to which electronic

data processing could beneficially be applied. A team consisting of in-house staff and outside consultants was established and the report of the Systems Development Project was published in 1970, entitled An integrated information system for the National Library of Canada.[1] The report recommended a system composed of five main subsystems: Acquisitions; Cataloguing, including the production of the national bibliography; serials control; the union catalogue; the union list of serials.

In order to implement the system, the Research and Planning Branch was established in the National Library in 1970. The Branch has two main mandates: the development of systems for the National Library, for other federal government libraries and participation in and promotion of cooperative and compatible systems in Canadian libraries generally; and the development and promotion of a Canadian library network. The staff of the Branch consists of systems librarians, computer specialists and programmers, organization and methods analysts, MARC format specialists and other researchers. It has a present staff of around thirty. An in-house Committee on Automation assists the Branch in planning automation projects, and in determining schedules and priorities. A recent survey of requirements for specific applications of EDP at the National Library indicated over twenty operations which should be automated; the long-range plan, worked out after priorities were set, extends to 1980. Priorities are given to external services, such as the national bibliography and the union catalogue, rather than to internal housekeeping operations such as acquisitions.

In planning the automation of systems and services which will be used by and will affect the whole Canadian library community, the National Library involves librarians from across the country and from various types of libraries. This is done in two ways: first, by establishing task groups to study and make recommendations on specific projects; and second, by obtaining the services of Canadian library experts on contract as consultants or by contracting with Canadian libraries to undertake studies or to develop specific parts of systems for the National Library. This makes maximum use of scarce expertise and avoids duplication in systems development.

In 1970, the National Librarian called a National Conference on Cataloguing Standards[2] to make recommendations on the means of establishing national bibliographic standards, as standardization is even more necessary to automated library systems than it is to manual systems. As a result of the conference, a number of task groups were established by the National Librarian to study specific problems.

The Canadian Task Group on Cataloguing Standards presented its report in 1972[3]. Its recommendations included the use of the Anglo-American Cataloguing Rules, North American text, in both English and French language versions, as the basis for the creation of the bibliographic record. Other recommendations covered the development of additional schedules for subject headings and classification systems for use in specific Canadian fields such as history and literature, as the Library of Congress standards used by many Canadian libraries are not sufficiently comprehensive in these areas.

Following the establishment of standards for the creation of the bibliographic record, a second task group was established to consider a MARC format for Canada. The Canadian MARC Task Group submitted its report in 1972 and, after examining existing MARC formats from several countries, recommended a specific Canadian format which is very close to the Library of Congress format but which incorporates a new concept for the handling of bilingual bibliographic records[4]. The Canadian Task Group on Cataloguing Standards had recommended that Canadian libraries should be provided with bibliographic records which have access points in both official languages, i.e. main and added entries, subject headings and series entries where applicable. The MARC Task Group recommended the development of the 9XX fields of the format as language equivalence fields for carrying data for access points in the other official language than that used in the descriptive cataloguing of the particular item. For example, the record for an English language item catalogued in English will carry equivalent fields in French for main access points and vice versa. In recommending standards for the creation and the dissemination and exchange in machine-readable form of bibliographic records, both Task Groups stressed the need for Canadian libraries to remain as compatible with American standards as possible. As

a result of the recommendations of the MARC Task Group, a Canadian MARC Office was established in the Research and Planning Branch to implement the development of and maintain the Canadian formats.

The third Task Group appointed by the National Librarian is the Canadian Union Catalogue Task Group. This group follows logically on the work of the two previous task groups, which provided basic standards, and is concerned with the development of a national bibliographic data base for Canada, which would incorporate the existing Canadian Union Catalogue, presently a card system. The Task Group submitted an interim report to the National Librarian in 1973[5] which recommends that the National Library "should establish and coordinate a Canadian union catalogue system in cooperation with provincial/regional library systems" and "that this system shall consist of a national union catalogue centre at the National Library of Canada and a number of regional bibliographic centres." These regional centres may provide cataloguing support services and other services as agreed upon by the regions concerned. The implementation of these recommendations will be discussed later in the paper.

In order to continue with the development of library standards which are essential for automated systems and to participate in and promote the development and use of international standards by Canadian libraries, an Office of Library Standards has been established in the National Library. The office coordinates the work of the Canadian Cataloguing Committee with that of IFLA and ISO and provides the Secretariat for WG6 of ISO/TC46 on bibliography. A Library Documentation Centre is located in the Public Services Branch. The Documentation Centre acts as a referral centre and collects data on all aspects of libraries and information science, both published and unpublished, especially concentrating on technical reports of library systems development, and provides a reference and documentation service to National Library staff and to Canadian libraries. The Centre is also the Canadian correspondent for UNESCO's ISORID (International System on Research in Documentation) program and acts as a clearing house for IFLA papers.

Canadiana, the national bibliography

First priority for implementation of the five subsystems of the total information system recommended for the National Library was given to the subsystem which includes the national bibliography, as this is a basic national and international service. Since Canada follows the Library of Congress in developing separate MARC formats for each type of library material, monographs, serials, audio-visual, etc., and since many types of material are included in Canadiana, it was necessary to divide its development into three phases. The first phase, which is now operational, covers monographs; the second phase, which is scheduled to be operational in 1975, will cover serials and government documents; the third phase covering audio-visual materials is scheduled for 1976. The Canadiana system is based on the creation of a full Canadian MARC record for each item processed. From the resulting Canadian MARC data base various products are produced: the photocomposed text and index of the national bibliography, unit cards for a weekly proof service, Canadian MARC tapes, and cards for inclusion in the National Library's own catalogues. The system is designed so that it can also process the non-Canadian items catalogued by the National Library.

The Canadian MARC format for monographs has been completed and published[6] and the format for serials will go to press shortly[7]. The MARC Office is presently working on a format for authority files. The National Library has also produced draft mini-MARC formats for both monographs and serials as a basic minimum standard for reporting to the national bibliographic data base.[8]

Phase I of Canadiana produces records created according to the Anglo-American Cataloguing Rules and the International Standard Bibliographic Description - Monographs and the records are distributed in the Canadian MARC format which is in compliance with ISO 2709, Documentation - Format for bibliographic interchange on magnetic tape.

Before beginning a Canadian MARC Tape Service on a regular basis, the National Library decided to make 1974, the first year of tape distribution, an experimental one. Canadian libraries which were already subscribers to the Library of Congress MARC tapes or which had supplied a member to the Canadian MARC Task Group were invited to participate in the Canadian MARC Tape Pilot Distribution Project. These libraries were selected because they already had MARC experience. In return for receiving the tapes free for one year, the participating libraries were asked to use the tapes in one computer application and report to the National Library on their use. A number of meetings of the eleven participants assuring that the National Library receives feedback from the Canadian library community on the format and tape service.[9] The tapes will be offered on a regular subscription basis in 1975.

In the context of Universal Bibliographic Control and in order to make as many MARC records as possible available to Canadian libraries for use in their automated systems, the National Library wishes to exchange its Canadian MARC tapes with other countries. The National Library policy for this exchange is to supply tapes free of charge to another national library or bibliographic centre which can disseminate the Canadian tapes within its country and use them in any applications it wishes, as long as the National Library of Canada receives reciprocal privileges. The National Library is planning a MARC Record Service which will supply both Canadian and non-Canadian MARC records to Canadian libraries. This service will be offered on a cost-recovery, non-profit basis.

Canadian National Bibliographic Data Bank

The National Library presently has a Canadian Union Catalogue on cards which represents the holdings of 331 Canadian libraries. The catalogue contains approximately 12 million cards in 9,554 drawers, which represent three to four million titles. In 1973-74, 1,610,416 accessions to the catalogue were received, that is more than 6,400 per working day and 129,268 location requests were searched in the catalogue, i.e. about 500 per working day.

This large manual operation is rapidly reaching the point where automation is essential and a better service could be provided by an automated catalogue. For example, the present catalogue is searchable only by main entry, the automated catalogue can be searched by multiple access points.

The Canadian Union Catalogue Task Group has recommended that the existing card catalogue be closed and that a new automated catalogue system be developed.[5] This new automated catalogue would tie into union catalogues at a number of regional centres. The National Librarian has accepted the Task Group's recommendations in substance and the National Library is now actively planning for the automation of the catalogue. A major planning document is the Canadian National Bibliographic Data Base Study which was conducted under contract for the National Library by Mr. R. Duchesne of the British Library.[10] A study of interlibrary lending in Canadian libraries is underway, also being conducted under contract for the National Library by the University of British Columbia Library.

The planned national bibliographic data base will incorporate the location service aspects of the existing union catalogue and, in addition, it will be able to provide cataloguing support services. It is planned to use MARC tapes from various countries to feed the data base, so that in many cases there will already be a MARC record in the system against which to match the accessions received from Canadian libraries. It is planned to publish the catalogue at intervals on computer output microfilm, thus disseminating the data to regional centres and large Canadian libraries and permitting them to do their own location searching for interlibrary loan purposes. The automated catalogue is planned as a combined batch and on-line system. In the first phase, only National Library staff will be able to access the catalogue on-line, but gradually other Canadian libraries will be directly connected by terminals. It is proposed to develop authority files to assist in solving the problem of handling bibliographic records in both English and French and also to coordinate and match headings received from various sources and developed according to different cataloguing rules.

As in the case of the studies undertaken under contract for the planning of the national bibliographic data base, the National Library invovles other libraries as much as possible in its planning and development work. A contract with York University led to the establishing of an international project for the creation of a serials data base. The National Library together with the Library of Congress and other large North American libraries will be participating in the CONSER (conversion of serials) Project which aims at creating a serials data base of 200,000 to 300,000 titles in two to three years.[11] This data base will be made available to the project participants. The National Library will use the machine-readable records received from the CONSER Project as the basis of a Canadian serials bibliographic data base. The National Library is the Canadian agent for the International Serials Data System and records received from ISDS, Paris, will update the Canadian serials data base. The data base will be used to produce national, regional or local union lists as required by Canadian libraries.

In addition to the national bibliographic data bases for monographs and serials, the National Library is also considering the need for data bases of material for the blind and physically handicapped and of audio-visual and other special materials. The data bases will be tied together into a total system. A management information system will allow the National Library to monitor the use of the data bases and the accessions added to them by Canadian libraries and this will assist in the rationalization of collections of Canadian libraries by providing statistics on Canadian acquisition of material in various subject areas, as well as identifying the types of material which cannot be located in Canada for interlibrary loan purposes. This

will provide data for national planning.

To summarize, the National Library is actively planning a Canadian library network based on national bibliographic services for which the Library is now developing automated systems. In planning the network, the National Library involves Canadian libraries as much as possible in the planning and developmental work, by participation in cooperative projects, by the appointment of task groups and consultants, by contracting out studies and systems development, by acting as a referral centre and collection agency for information on Canadian library systems, by the use of pilot projects to get user feedback and by the provision of consulting services and training seminars on such topics as the Canadian MARC format. The Library also develops, in conjunction with Canadian libraries, the Canadian standards necessary for successful cooperative use of bibliographic machine-readable records and actively promotes the use of such national as well as international standards.

National Science Library[12]

As would be expected from its area of specialization in the sciences and technology, the National Science Library has concentrated its automated developments chiefly in the documentation and information retrieval areas. Planning for automation in the National Science Library and setting of priorities is based on government mandates for the provision of scientific and technical information and the demonstrated needs of its users, both researchers in its parent body, the National Research Council, and researchers with scientific and technical

information needs throughout Canada, including the provision of information support to government, industry and the universities.

The National Science Library's automated documentation systems are based on available tape data bases such as Chemical abstracts. A system for a personalized current awareness service providing selective dissemination of information, known as CAN/SDI, has been successfully developed and is widely used in Canada. CAN/SDI now processes over 1,800 individual profiles serving 6,000 users and cover 14 data bases. The Library has trained 500 search editors who are available across Canada to develop profiles for SDI users. The National Library and two other federal government libraries use the CAN/SDI programs to serve users in their areas of subject specialization.

To complement the current literature searches available on CAN/SDI, the National Science Library has developed an on-line enquiry system known as CAN/OLE to search data bases retrospectively. These data bases now include an estimated 4,000,000 references. This system is available to libraries across Canada via data communication lines. The on-line capability was found to be necessary for satisfactory retrospective searches against large data bases in order to permit human interface with the computer system to assure that only relevant data is retrieved. CAN/OLE is now operating as a pilot project and further development is planned to increase the capabilities of the system by adding an on-line edit and update module for data base maintenance. The National Science Library has available to it the comput er centre and experts of the National Research Council.

The National Science Library has also automated its Union List of scientific serials in Canadian libraries. The 5th edition includes 46,000 titles in 245 libraries and the National Science Library supports the interlibrary lending based on the union list by its own collection of 18,500 journals which are controlled by an automated in-house list of serials holdings.

The National Science Library, as part of the National Research Council, is involved in planning for a Canadian scientific and technical information network. This development takes place under the general direction of the National Librarian and with the assistance of a national Advisory Board on Scientific and Technical Information (ABSTI). The present plans propose the establishment of regional referral centres which would form part of the decentralized network.

The National Science Library and the National Library work in close liaison in the development of automated projects in order to avoid duplication of effort in both systems development and national planning. Developments in the two libraries are complementary and planning is based on the use of each other's systems. The National Library presently concentrates on the development of standards and of automated national bibliographic services: the National Science Library on information retrieval services utilizing available data bases.

Other federal government libraries

The National Librarian under the National Library Act, has authority to coordinate the activities of all federal government libraries. A team of experts under the direction of the Government Libraries Liaison Office of the National Library has just completed a Federal Government Library Survey which included a survey of library services and systems.[13] A comprehensive questionnaire with a section dealing with library automation and a separate questionnaire concerned with specific applications was distributed to 191 federal libraries and returns were received from 176 libraries. The results indicate that, with the exception of the two national libraries, automation has had little impact as yet on federal government libraries. Only 9.6% of the responding libraries were actually involved in operational automated projects. A number of

libraries are involved in SDI projects and the most frequently automated operation is serials control.

The response to the questionnaire indicated that federal government libraries saw a cooperative approach to the automation of processing activities, such as acquisitions and cataloguing as desirable. A cooperative cataloguing support system is being planned as part of the National Library's national bibliographic data base system.

The Federal Government Library Survey recommended that the National Library, in cooperation with the National Science Library organize five regional centres across Canada to promote services and interpret the Libraries' policy to other libraries in the regions and to facilitate the coordination of the resources of the Canadian library community and of network operations.[14] This recommendation ties in with the recommendations of the Canadian Union Catalogue Task Group for regional bibliographic centres.

A recent study of electronic data processing in the federal government has proposed that a Library and Information Retrieval Application Centre be established under the custodianship of the National Librarian to serve the data processing needs of all federal government libraries as well as other information retrieval applications of government departments. The development of such a Centre, now in the planning stage, will strengthen planning for automation on the federal government library level.

National associations

Neither of the two national library associations, the Canadian Library Association (CLA) or the Association pour l'avancement des sciences et des techniques de la documentation (ASTED) have divisions or committees specifically concerned with library automation in all types of libraries. ASTED is now considering the establishment of such a group.

The Canadian Association of College and University Libraries, which is a division of CLA, has a Committee on Automation which has sponsored

an annual workshop on library automation since 1966. These workshop presentations cover national planning for automated services as well as individual EDP applications in specific libraries. The Association of Universities and Colleges of Canada formerly had a Committee on Library Automation which in 1969 sponsored a complete survey of automation projects in university libraries, including the collection of data on types of computers used, level of staff involved, and the status and type of applications.[15] Automation in libraries has been developing so rapidly that this survey is now completely out of date and a comparable one has not been undertaken subsequently. The Library Documentation Centre of the National Library does gather information on library automation projects in Canada.

The Canadian Association for Information Science was established in 1969 and its interests include library automation. The Association now holds an annual conference on information science at which papers on library, information retreival, and documentation techniques and applications are presented.

These bodies all provide valuable forms for exchange of information on library automation. The community of senior systems staff in major Canadian libraries has been small enough that communication could be maintained by personal contacts and visits. However with recent increases in the pace of systems development in Canadian libraries, more formal and regular means of information exchange are becoming essential.

Planning at the provincial and regional level

As is to be expected in a country with a federal system of government, a great deal of planning takes place at both the national and provincial levels. In Canada, in addition to national library associations, there are frequently general provincial library associations as well as provincial or regional associations of university libraries. The university library associations in particular promote the development of cooperative projects in academic research libraries, including automated projects.

Canada can be divided into five regions: the Atlantic region (covering the four provinces of Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island); Quebec; Ontario; the Prairie region (including the provinces of Manitoba, Saskatchewan and Alberta); and British Columbia. These regions are practical

groupings for library cooperative developments as many provinces are too small to support major network nodes based on regional bibliographic centres or data bases.

However, regional development is complicated by the existence of separate provincial governments. Provincial government administration involving libraries is also frequently further complicated in that different departments of government may be concerned with different types of libraries, elementary and secondary school libraries, college and university libraries and public libraries.

The Canadian Union Catalogue Task Group has recommended that the Canadian Union Catalogue system should be based on a national bibliographic data base at the National Library in Ottawa (now being actively planned) which would be related to provincial or regional bibliographic centres and data bases. These regional centres would report library holdings to the national bibliographic data base, but they would also provide other services, such as cataloguing support, to their own regions as required. The Canadian Union Catalogue Task Group held informal regional meetings across Canada to determine regional plans and requirements which should be considered in planning the total Canadian network.

A number of developments are presently taking place or are being planned in Canada at the regional or provincial level, sometimes through informal cooperation, less frequently on a more formal basis. The following brief survey of some of the activities in the five regions of the country will give some indication of the direction that planning for library automation is taking on the provincial or regional level.

British Columbia

A considerable amount of library planning on a provincial scale has been done in British Columbia which has resulted in cooperative arrangements for interlibrary loans, collection sharing and other activities, especially among university and college libraries.[16] The three universities of the province (the Universities of British Columbia and Victoria and Simon Fraser University) have established an informal

body known as TRIUL (tri university libraries) which also has representatives from college libraries and the two largest metropolitan public libraries. TRIUL has a Systems Committee which plans and implements cooperative automated projects and which is actively pursuing plans in the acquisitions and cataloguing areas.

The British Columbia Library Development Commission submitted a report in 1973, entitled Programme for library development in the Province of British Columbia, which recommends the establishment of a resource and bibliographic centre and a union catalogue at the provincial level.[17] These plans would at first be applied to public libraries but long range plans call for the inclusion of all types of libraries in the province according to their needs.

Thus mechanisms exist in British Columbia for overall provincial planning. Although the report of the Library Development Commission does not specify automation as a means of operating library systems, the overall plans will greatly facilitate the use of EDP where it can be proved to be economically benefical. The three university libraries already have a number of advanced operational automated procedures and are taking advantage of one another's developments.

A question to be resolved is whether British Columbia can itself support a large bibliographic centre and data base or whether it would be more feasible to develop a centre together with the Prairie Provinces to cover libraries in Western Canada.

Prairie Provinces

Planning for university libraries on a regional level has involved all three provinces of Alberta, Saskatchewan and Manitoba. In 1969, the Interprovincial Committee on University Rationalization (IPCUR) authorized a study conducted by a team of experts headed by Dr. R. Shank. The report of the study covered automated library systems especially from the point of view of collections development, resources sharing and the relationship to national computerized and cooperative systems.[18]

The report did not recommend centralized processing for the prairie university libraries, but did recommend the establishment of a Library System Development and Service Office under IPCUR and emphasized long range planning. Little action has been taken to date on this report.

The Council of Prairie University Libraries (COPUL) is promoting an inventory of computer programs for library automation in university libraries and the sharing of programs for use by other libraries in the group. A concrete example of this is the present implementation at the University of Calgary of the system for acquisitions and cataloguing developed by and operational at the University of Saskatchewan.

A major study, the Alberta Library Study, is exploring the role that libraries will play in that province in the 1970's and 1980's. The Study will produce a plan for future library development in the province. A group of Alberta libraries are cooperating in the automated production of a provincial union list of serials.

The province of Saskatchewan has a manual union catalogue which covers public but not university libraries. There have been recent discussions on the need for union catalogues at the provincial level, at least for public libraries, in all the Western provinces. However, it is unlikely that each province could afford to individually support the development of an automated union catalogue system. At the regional meeting of the Canadian Union Catalogue Task Group held to discuss the need for regional bibliographic centres and data bases in British Columbia and the Prairie Provinces, it was recommended that four provincial bibliographic centres be established to tie in with the Canadian Union Catalogue in Ottawa, however, the meeting indicated that the Task Group should work towards the establishment of one regional centre for Western Canada. This development will be complicated by the existence of four provincial jurisdictions.

University libraries in the Prairie region have a number of automated developments. The University of Saskatchewan Library was a pioneer in the use of MARC tapes in Canadian Libraries and has hopefully set a precedent in generously making its programs and expertise available to other libraries, including the National Library.

Ontario

Planning on the provincial level for automated cooperative library systems in the large and rich province of Ontario has progressed faster than in other regions of Canada. Planning is underway for three groups of different types of libraries, university, college and public, to develop cooperative bibliographic centres which can provide services to their member libraries.

The College Bibliocentre provides centralized processing for technical and specialized colleges in the province and has automated a number of procedures including current awareness listings, and card and book catalogue production. The Centre makes use of the on-line MARC data bases maintained at the University of Toronto Library Automated Systems (UT/LAS) centre.

Under the auspices of the Board of Library Coordination of the Council of Ontario Universities, an Ontario Universities Library Cooperative System (OULCS) has been established to develop cooperative systems for the libraries of the fourteen Ontario universities.[19] OULCS projects now underway or being planned, which will utilize automated systems, include systems for a union list of serials, map cataloguing, government documents, subject headings and a cataloguing support service. OULCS arranges with libraries in the cooperative group to do the developmental work and to process the operational systems.

The OULCS Monograph Demonstration Project, as the pilot project for the cataloguing support/union catalogue system is known, is an on-line system using the facilities of the University of Toronto Library Automated Systems computers and an adaptation of the software developed by the University of Toronto. The pilot project involves five Ontario and two Quebec University libraries and if successful will be expanded to take in other Ontario and

Quebec university libraries. The on-line system is based on Library of Congress MARC, Canadian MARC and British MARC data bases. A library wishing to catalogue an item, queries the data base to discover if a record for the item is already present. If a record is present, the library then makes what small modifications may be necessary both for its individual needs and to bring the record up to the cooperative group standards and adds the record to the OULCS union file together with an indication that it holds that item; thus the union data base automatically becomes a union catalogue. If a record is not in the data base, the library catalogues it and adds it to the union file. Each library has an individual user's file to which data differing from that contained in the union file can be stored. However, libraries are encouraged to use the records found in the data base with minimum modification. Options provided for cataloguing products, such as cards, are kept to a minimum and emphasis is on cooperative agreement on a minimum set of standards, in order to keep costs of systems development and of processing as low as possible. Non-essential changes to cataloguing data in records already in the system are discouraged by extra charges to libraries which modify for their own use records already meeting the union standard. The system produces catalogue cards, book cards and labels and book catalogues.

The experience gained by the Monograph Demonstration Project will be valuable as it tackles a number of problems: the use of a system developed by and run at one insitution by a cooperative group of institutions; cooperation by university libraries from two provinces, thus receiving their major funding from two jurisdictions; the limits to which libraries will give up their individual cataloguing idiosyncrasies and conform to a union standard; the use of a single data base by English and French language libraries.

Almost all Ontario university libraries have automated operations; many of these will become cooperative projects under OULCS auspices and union files will be produced.

Public libraries in Ontario under the direction of the Provincial Library Director and the Directors of Ontario Regional Library Systems (DORLS) have set up a study group to examine the establishment of a cooperative cataloguing support system for public libraries. Several regional public library systems already use the facilities of the University of Toronto Library Automated

Systems for cataloguing and it is possible that another cooperative group similar to OULCS but for public libraries may use an adaptation of the same Toronto system.

Thus in Ontario, planning is underway for three major bibliographic systems for university, college and public libraries. The level of bibliographic data required by these different types of libraries may vary and the trend appears to be towards three subsystems of a total bibliographic system operated at a single bibliographic centre, each subsystem providing varying levels of data complexity, but with enough standardization so that union files are possible. Such a multi-level bibliographic system would become the Ontario regional node in a national Canadian library network and would feed the national bibliographic data base.

Quebec

Cooperative planning for library systems in Quebec also involves three groups of libraries, university, college and school libraries and public libraries.[20]

A Centrale des bibliothèques provides centralized processing and other bibliographic services for the province's CEGEP's (Collèges d'enseignement général et professionnel) since 1967, the Centrale has been part of the provincial Department of Education. In the past five years a number of colleges have attempted to automate some of their operations, sometimes as individual projects and sometimes as pilot or model projects under the auspices of the Centrale. In order to concentrate automation efforts for the use of all libraries, in 1973 the province established CIDBEQ (Centre d'informatique documentaire des bibliothèques d'enseignement du Québec) as a library automation centre intended to cover all libraries coming under the jurisdiction of the Department of Education, including colleges, elementary and secondary school and university libraries. However, university libraries have not become involved in CIDBEQ, but have made their own plans. CIDBEQ is planning an on-line cataloguing support system which may be operational on a limited basis at the college level late in 1975.

University libraries in Quebec have been studying cooperative automated library systems for some time. The formal organization for university library cooperation is the Comité des bibliothèques of the Conférence des recteurs et des principaux des universités du Québec. As a result of a number of studies of automated library systems, especially cataloguing support systems, including a study for a centralized automated cataloguing system for the newly organized multi-campus Université du Québec, the Comité des bibliothèques decided to join the OULCS Monograph Demonstration Project of Ontario University libraries. Two Quebec university libraries are participating in the pilot project and other potential participants are gathered together in a users group which directs and evaluates Quebec university participation.

A number of Quebec university libraries have automated systems and the Université Laval has in particular been one of the pioneers of Canadian library automation and creates some of its own data banks like the CARTOMATIQUE Project for non-autonomous maps. The Université du Québec has developed its own system called BADADUQ (Banque de données en accès direct de l'Université du Québec) and is not participating with other Quebec university libraries in the OULCS Project.

Public libraries and the Bibliothèque nationale du Québec unlike academic libraries, are dependent on the Department of Cultural Affairs. This group of libraries is also now doing overall planning and a number of operations at the Bibliothèque nationale are automated. Provincial government libraries are also doing general planning, so the groundwork is being laid for cooperative automated systems.

Atlantic Provinces

The four Atlantic provinces have not done any joint planning for regional automated library developments, but after a first negative reaction to a possible regional bibliographic centre expressed at a regional meeting of the Canadian Union Catalogue Task Group, interest now seems to be

growing for such a centre. Each province has some centralized planning and manual services for public and school libraries, but the university libraries are completely separate from this group, with the exception of Nova Scotia where the provincial union catalogue (manual) covers all libraries in the province, public, special and university. This is the only complete provincial union catalogue and it reports it holdings to the Canadian Union Catalogue in Ottawa locating an item only to the province and not to the specific library.

There are a small number of automated operations in Atlantic university libraries but there are as yet no plans for major automated cooperative projects. Provincial boundaries in the four provinces act as barriers to cooperative systems and the provinces are all too small to support an automated bibliographic centre or data bank.[21]

Summary

To summarize the situation regarding regional planning for library automation in Canada, it seems likely that a mixed system will prevail for some time. The central provinces of Ontario and Quebec are most advanced in planning bibliographic systems for various types of libraries. These would become subsystems of a total provincial system which would be a node of a national system.

The Western and Eastern areas of Canada each consist of four provinces, none of which appears large enough to support a sophisticated bibliographic centre, but which, if jurisdictional problems could be overcome, could group together into viable regional systems.

Planning at the local or individual institution level

Planning for and selection of projects for automated development in individual Canadian libraries has generally been on the basis of the most critical area. Areas where the need to handle large volumes of data and numerous transactions, such as circulation and lists of serials held, are frequently selected for attention because the existing systems are breaking down. Few libraries have taken the total systems approach, but have initiated

automation projects one at a time as staff and funds permitted. Impetus for systems development usually comes from the individual libraries themselves. The National Library has been forced to take a more general systems approach because of the magnitude of its national bibliographic services and the need to tie into other national and international systems.) Feasibility studies are frequently conducted for individual projects for the automation of one area of a library. Planning documents are prepared at budget time to support requests for funds or demonstrate cost benefits. In general, Canadian libraries have been very cost-conscious and pragmatic about automating library operations and the results have been generally very successful. Operations have only been automated because there was a real need, resources have not been sufficient for status symbol and blue sky projects. Automation is a necessity not a luxury.

Although no recent survey of library automation projects has been made (federal government libraries were surveyed in 1973[13] and university libraries in 1969[15]) some generalizations can be made. University libraries are the most advanced in automated operations and with the exception of user oriented services such as SDI, the principal applications are of the internal housekeeping variety, circulation, catalogue card production, acquisitions, and periodicals control and listings. Some large public library regional systems are also now automating their centralized processing services. Special libraries have special thesauri and subject listings.

To date, cataloguing systems generally have not produced data to the full MARC format level. However with the increasing emphasis on cooperative and shared cataloguing systems, it is hoped that cataloguing data will reach at least the National Library's mini-MARC standard. An increasing use of MARC data from various countries will encourage this, as will the need to report in machine-readable form to the national and regional bibliographic data bases.

Only one library in Canada, the University of Toronto, has its own computer hardware, in this instance two Xerox-Sigma machines. University libraries use the facilities of the university computer centre. Variations in the charges made to the university libraries for use of these facilities make any attempts at cost comparisons exceeding difficult and unreliable. Other libraries use service bureaux. The majority of systems are run in a batch mode, although on-line applications are becoming more common and are recognized as advantageous,

especially for cataloguing support and data base maintenance, as well as for searching large files. Higher level programming languages used for library applications are most frequently COBOL and PL/1.

The acquisition of experienced systems staff for libraries, especially at the managerial and senior levels is still highly competitive. Experienced systems librarians, computer analysts and programmers with knowledge of and interest in library applications are in short supply. However, new graduate librarians now have taken courses in library automation and have frequently done some programming. Most university libraries have systems experts on their own staff, although these may be supplemented by personnel from the university computer centre. Experienced outside consultants who know library applications are scarce and total dependance on them may be disastrous.

Resistance to change and fear of automation in libraries is gradually dispersing with the successful implementation of systems and with an increasing number of younger librarians having received automation courses as part of their training, but there is still a need for in-house training and refresher courses to bring staff up-to-date.

Despite these problems, Canadian libraries have made real and exciting progress in automating their operations and very few large libraries can now maintain their same level of service without the help of the computer.

Conclusions

A great deal of overall planning for automation in Canadian libraries is being done at the national level and an increasing amount at provincial and regional levels. The development of essential national standards is proceeding almost at the pace of the operations which require them and is keeping up with international standard developments.

As salaries increase, costs rise and budgets fail to increase proportionately, libraries are becoming increasingly interested in cooperative and shared systems. This is particularly apparent in the area of cataloguing support. The high cost of technical services is forcing libraries to attempt to find bibliographic records for items awaiting processing from external sources if possible. The high cost and complexity of creating and maintaining the MARC data bases necessary to access these externally created records is causing libraries to look to cooperative cataloguing support systems, preferably on-line. A benefit resulting from budgetary deficiencies and rising costs is that libraries are becoming more and more willing to accept cataloguing from other sources without modification. This will promote standardization, take advantage of the production of national data resulting from Universal Bibliographic Control, assist in the production of union files, as well as save money for individual libraries and hopefully it will speed the delivery of information to the users.

Cooperative library systems and networks have been discussed for years by Canadian librarians, but they now appear to be on the verge of realization, with the present concrete planning for national and regional bibliographic data bases on which a total Canadian library network can be built. All parts of the network will not evolve at the same pace, but a substantial start has been made and the impetus is strong.

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